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10 Attorneys for Defendant:
11 QUICKEN LOANS INC.

12 UNITED STATES DISTRICT COURT
13 CENTRAL DISTRICT OF CALIFORNIA
14 WESTERN DIVISION
15

16 AMANDA HILL and GAYLE HYDE,
individually and on Behalf of All Others
17 Similarly Situated,

18 Plaintiffs,

19 v.

20 QUICKEN LOANS INC.,

21 Defendant.
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Case No. 5:19-cv-00163-FMO-SP

**WRITTEN TESTIMONY BY
DECLARATION OF PHILIP
GREENSPUN, Ph.D. IN SUPPORT
OF QUICKEN LOANS' MOTION
TO COMPEL ARBITRATION**

Date: TBD

Time: TBD

Ctrm.: 6-D

Judge: Hon. Fernando M. Olguin

**WRITTEN TESTIMONY BY
DECLARATION OF PHILIP GREENSPUN, Ph.D.**

I, Philip Greenspun, declare and testify under oath as follows:

1. Pursuant to the Court's March 25 Order (ECF No. 92), I submit this Written Testimony by Declaration in support of Quicken Loans' Motion to Compel Arbitration (ECF No. 29).

2. I make this Declaration based on my personal knowledge, personal and professional expertise in computer programming, software and website design, my experience as a teacher within the Department of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology ("MIT"), and review of the materials and documents identified in Exhibit A hereto. All of the materials and documents underlying and supporting my testimony and expert opinions were identified and disclosed in my Expert Report in this matter, which I understand was provided to Plaintiffs' counsel on or about February 18, 2020. A copy of my Expert Report is attached hereto as Exhibit B. If called as a witness in this action, I could and would testify competently as to the matters set forth herein.

3. I incorporate by reference the opinions stated in my rebuttal report (attached hereto as Exhibit B), with the exception of paragraphs 8, 47-51, 54-58, and 62-65.¹

ASSIGNMENT AND SUMMARY OF OPINIONS

4. I have been retained by counsel for Quicken Loans Inc. in the above-captioned litigation as an expert witness to respond to the opinions in the January 17, 2020 report submitted by Alexander Young on behalf of Plaintiff Amanda Hill (the "Young Report"), and to testify as a rebuttal witness to Mr. Young at the evidentiary

¹ I understand that the parties agreed Alexander Young would not present direct testimony on one of the issues in his report, and so I do not adopt or incorporate here the section of my report rebutting that testimony. I also have omitted from my declaration those exhibits to my report that I do not discuss in my testimony submitted here.

1 hearing in this matter. As noted, on February 18, 2020, I provided an Expert Report
2 in rebuttal to the Young Report containing my opinions (Exhibit B).

3 5. My testimony and opinions concern (1) whether Ms. Hill clicked the
4 submission button on the LMB.YourVASurvey.info website, and (2) whether the
5 Terms of Use hyperlink was visible to Ms. Hill when she visited the
6 LMB.YourVASurvey.info and LowerMyBills.com websites on or about October 10,
7 2018 and November 12, 2018, respectively.² Based upon my expertise and review
8 of the technological and other evidence, my testimony and opinion is that the answer
9 to both questions is “Yes.”

10 6. More specifically, and as explained below, my testimony and opinions
11 in this matter are that (1) all of the available technical evidence supports only the
12 conclusion that Ms. Hill clicked the “See my results!” button on the
13 LMB.YourVASurvey.info website during her visit on October 10, 2018; (2) the
14 “Terms of Use” hyperlink on the LMB.YourVASurvey.info website was plainly
15 visible to Ms. Hill—as Mr. Young found in his report—during her visit to that
16 website on October 10, 2018; (3) that Mr. Young’s conclusion that Ms. Hill “lacked
17 any reasonable opportunity” to view the “Terms of Use” hyperlink during her visit
18 to the LMB.YourVASurvey.info is flawed and unsupported by the record evidence;
19 and (4) the terms and conditions for the LowerMyBills.com website were visible to
20 Ms. Hill during her visit to that website on November 12, 2018.

21 **QUALIFICATIONS AND MATERIALS CONSIDERED**

22 7. My experience and expert qualifications are detailed in my Expert
23 Report (Exhibit B at 5-7), and in my curriculum vitae, a true and accurate copy of
24

25 ² In addition to the two websites visited by Ms. Hill that are at issue—
26 LMB.YourVASurvey.info and LowerMyBills.com—Mr. Young’s Report offered
27 several exhibits and opinions on the appearance and operation of a third website,
28 called YourVASurvey.info (without the ‘LMB’ preceding the site’s address). I
understand Ms. Hill did not visit this third website, and so it is not relevant to
understanding her experience. Therefore, I do not respond to the Young Report’s
discussion of that website.

1 which is attached as Exhibit C hereto. For purposes of this Declaration, I further
2 summarize my experience and expert qualifications in Paragraphs 8 and 9 below.

3 8. I hold a Ph.D. in Electrical Engineering and Computer Science from
4 MIT, awarded in 1999. My thesis concerned the engineering of large online Internet
5 communities with a web browser front-end and, as part of the back-end, a relational
6 database management system (RDBMS) containing site content and user data. I also
7 obtained a Bachelor of Science Degree in Mathematics and a Master of Science
8 Degree in Electrical Engineering and Computer Science from MIT.

9 9. In addition to my educational experience, I have over 40 years of
10 experience in computer programming, software, and website design, including
11 building various electronic commerce websites with interfaces for user interaction
12 and supported by back-end databases similar to the websites at issue here, and
13 supervising dozens of software development projects. I have worked on projects
14 developing websites for Oracle, HP, Siemens and the World Bank. In the mid-
15 1990's, I built and distributed a free open-source toolkit for building community-
16 oriented web applications, which was later used by over 10,000 websites worldwide.
17 I also have authored five computer science textbooks, which include topics on
18 methods for implementing information systems accessed via a web browser and
19 website design principals. Additionally, as a teacher within the Department of
20 Electrical Engineering and Computer Science at MIT, I have also taught students
21 how to develop Internet applications and websites, with an emphasis on trying to
22 improve the user experience.

23 10. As outlined in my curriculum vitae (Exhibit C), I have served as an
24 expert witness in numerous proceedings in federal court, including on patent and
25 other matters concerning software design and development.

26 11. My opinions in this matter are based on (a) my own personal and
27 professional experience and expertise, including as an academic, teaching in the field
28 of webpage design; (b) my professional experience having designed and created

1 consumer-facing websites and client applications with back-end servers for my own
2 and other companies; and (c) the materials and technological evidence identified in
3 Exhibit A, including, among other things: (i) the evidence and other technical
4 information provided by the parties that Mr. Young considered and relied upon
5 (including the video playbacks provided by the third-party compliance software
6 companies ActiveProspect and Jornaya); (ii) server logs from the records of
7 LMB.YourVASurvey.info and LowerMyBills.com; (iii) the HTML, CSS and
8 JavaScript code applicable to the LMB.YourVASurvey.info website in October
9 2018; (iv) publicly available code and technical information about the websites at
10 issue; and (v) the declaration testimony and other exhibits submitted in this matter.

11 OPINIONS

12 **A. The Technological Evidence Supports Only The Conclusion That Ms.** 13 **Hill Did Click The “See My Results!” Button On The** 14 **LMB.YourVASurvey.Info Website, And Mr. Young Offers No Reliable** **Evidence To The Contrary.**

15 12. In his report, Mr. Young opines that he “can conclude with technical
16 certainty and using multiple sets of evidence that Ms. Hill did not click the ‘See my
17 Results!’ submit button” on the LMB.YourVASurvey.info website.³ I disagree with
18 Mr. Young because, in my opinion, all of the available technical evidence supports
19 only the conclusion that Ms. Hill did, in fact, click the “See my results!” button on
20 the LMB.YourVASurvey.info website when she visited the site on October 10, 2018.
21 In fact, nothing in Mr. Young’s report nor in any of the technical evidence that he
22 points to (and which I have reviewed), indicates that Ms. Hill did not click that button.

23 13. First, Mr. Young contends that the code for the current version of the
24 LMB.YourVASurvey.info website “submits data on actions not associated to the site
25 visitor clicking the ‘See my results!’ button.”⁴ It is unclear what Mr. Young means
26

27 ³ Young Report at 11. The portions of Mr. Young’s report that I reference in this
28 Declaration are attached as Exhibit F.

⁴ Young Report at 10.

1 by this statement, and he provides no analysis to support his contention. If Mr. Young
2 is speculating that the code somehow indicates that Ms. Hill's phone number was
3 submitted to the LMB.YourVASurvey.info website without her having clicked the
4 "See my results!" button, I found no support for that occurring in my review of the
5 code for the LMB.YourVASurvey.info website in place in October 2018. In
6 addition, in my professional experience with designing and operating websites, Mr.
7 Young's unsupported contention posits something that would be highly unusual in
8 website design and function.

9 14. My review and analysis of the website and the JavaScript code sent to
10 the browser by the LMB.YourVASurvey.info site, and my analysis of the network
11 requests sent by the JavaScript programs running on the website, did not uncover
12 anything to support Mr. Young's statement or that Ms. Hill did not click on the "See
13 my results!" submit button. The JavaScript code for the website contains a function
14 (the "doPayable" function) that is associated with the "See my results!" submit
15 button. When the submit button is clicked on a mobile device, the "doPayable"
16 function is run by the browser, which then calls the "submitFormData" function. The
17 "submitFormData" function then results in the data entered by the user on the
18 submission form being transmitted to the website's servers. In my review and
19 analysis of the JavaScript code for the LMB.YourVASurvey.info website, I did not
20 identify any function that resulted in data being transmitted to the website's servers
21 in the absence of the "See my results!" button being clicked. I likewise did not
22 observe any code that would suggest it was possible the website collected and
23 retained data without a user clicking the "See my results!" button.

24 15. To confirm my analysis, I visited the LMB.YourVASurvey.info website
25 and navigated through the pages and forms by submitting my own information to
26 follow Ms. Hill's experience and Mr. Young's re-creation of her experience. During
27 my visit I used the Google Chrome developer tools, which enable the monitoring of
28 network traffic (*i.e.*, how and when information that was input into the web form was

1 actually sent and received by the LMB.YourVASurvey.info server database). From
2 the developer tools I observed that the message from the “submitFormData” function
3 was sent to the website’s servers only after I clicked on the “See my results!” button,
4 and not before then. This is another indicator that the website collects and stores any
5 information a user enters on the site only after the “See my results!” button is clicked
6 by the user (and not before).

7 16. I also reviewed a version of the LMB.YourVASurvey.info website
8 HTML, CSS and JavaScript code from October 2018 that was provided by Larry
9 Smith (the Chief Technology Officer of Suited Connector, which operates the
10 LMB.YourVASurvey.info website) to assess how the website operated at the time of
11 Ms. Hill’s visit to the site in 2018.⁵ Based upon that review, I can also conclude that
12 in October 2018, the LMB.YourVASurvey.info website operated in much the same
13 manner as it does in present day, and contained the same “doPayable” and
14 “submitFormData” functions. Thus, from review of the relevant computer code for
15 the LMB.YourVASurvey.info website from October 2018, I can conclude that there
16 were no functions or other indicators to support that the site would have received and
17 retained Ms. Hill’s phone number (or any other personal information about her), and
18 then provided it to LowerMyBills.com, without her having clicked the final “See my
19 results!” submission button.

20 17. Second, Mr. Young concludes that, because the ActiveProspect video
21 playback of Ms. Hill’s visit to LMB.YourVASurvey.info does not show the “Thank
22 You” page that a visitor to the site would have seen after clicking the “See my
23 results!” button, Ms. Hill did not click the button.⁶

24 18. My review of the technological evidence confirms, however, that Mr.
25 Young’s opinion based upon the ActiveProspect video is incorrect. Mr. Young

26 ⁵ Mr. Young’s report does not opine on how the LMB.YourVASurvey.info site
27 functioned in October 2018 at the time of Ms. Hill’s visit, and only addresses how
28 the site operates in present day.

⁶ Young Report at 10-11.

1 ignored the best evidence regarding how ActiveProspect's video recording software
2 (TrustedForm) works, which is the publicly-available documentation describing the
3 software that the company supplies to web publishers and programmers. A true and
4 accurate copy of that documentation, which I obtained from ActiveProspect's
5 website, is attached hereto as Exhibit D. That documentation explains that the video
6 playback software "stops recording once the web form submits [which] typically
7 occurs when a user clicks the 'submit' button after entering the required information
8 into the form. TrustedForm users cannot adjust this behavior and therefore cannot
9 change when the TrustedForm video stops recording prior to the form submission."
10 Exhibit D at 2. The absence of the "Thank You" page in the ActiveProspect video
11 reconstruction is thus expected and consistent with how the service is supposed to
12 function, and is in no way suggestive that Ms. Hill did not click the "See my results!"
13 button, as Mr. Young incorrectly concludes.

14 19. Third, Mr. Young compares (a) the Jornaya video playback of Ms. Hill's
15 visit to LMB.YourVASurvey.info in October 2018, against (b) the Jornaya video
16 playback of Ms. Hill's later visit to the different website for LowerMyBills.com in
17 November 2018.⁷ Mr. Young makes a similar conclusion as he does with the
18 ActiveProspect video, asserting that because the LMB.YourVASurvey.info Jornaya
19 video of Ms. Hill's visit does not include a "Thank You" page, while the
20 LowerMyBills.com Jornaya video does include such a page, this is evidence that Ms.
21 Hill did not click the button on LMB.YourVASurvey.info during her October 2018
22 visit.⁸ While I agree with his implicit conclusion that the presence of the "Thank
23 You" page in the Jornaya video for the LowerMyBills.com website supports that Ms.
24 Hill clicked the submission button on the LowerMyBills.com website during her
25 November 2018 visit to that website, I do not agree with Mr. Young's opinion that
26 "there would be no reason why the two Jornaya videos would not be consistent." He

27 ⁷ Young Report at 10-11.

28 ⁸ Young Report at 11.

1 is wrong because structural and code differences between the
2 LMB.YourVASurvey.info and LowerMyBills.com explain the purported
3 inconsistency in the videos. That alleged inconsistency is thus not at all indicative
4 of whether Ms. Hill clicked the “See my results!” button during her October 2018
5 visit to LMB.YourVASurvey.info.⁹

6 20. Both the LMB.YourVASurvey.info and LowerMyBills.com websites
7 operate as “single-page applications.” In a single-page application, a multi-part form
8 presents what *looks like* a series of multiple different webpages (called “cards”) to a
9 user without the application having to go back to the server to store or retrieve any
10 of the data inputted by the user. In fact, the application *is continuously running* a
11 JavaScript program on the same webpage as the user fills out the form. When a user
12 leaves the single-page application, any JavaScript programs running on that page will
13 terminate and a new page will load.

14 21. The LowerMyBills.com website operates as a single-page application
15 all the way through each different screen: the form (with each screen represented as
16 a “card”) displaying survey questions *and* the “Thank You” confirmation page. The
17 same JavaScript, including any third-party software such as Jornaya’s video replay
18 service, operates continuously from the start of the survey form (the first card)
19 through the “Thank You” page (the last card). Thus, the termination of the Jornaya
20 JavaScript on LowerMyBills.com would include the Thank You page, which
21 explains why the video playback for the LowerMyBills.com website shows the
22 “Thank You” page.

23 22. In contrast, the LMB.YourVASurvey.info website (which is operated
24 by a different company called Suited Connector, and thus was programmed and
25 coded differently than the LowerMyBills.com website) operates as a single-page
26 application through all of the different parts of the form (cards) displaying survey
27 questions, but terminates with the final survey question (the last card), which is the

28 ⁹ Young Report at 11.

1 page displaying the “See my results!” submission button. Thus,
2 LMB.YourVASurvey.info’s single-page application does *not* include the “Thank
3 You” page. For this reason, when a user clicks the “See my results!” button, the
4 JavaScript accompanying the survey questions terminates, and this includes
5 termination of the Jornaya JavaScript running on the webpage. The “Thank You”
6 page is then loaded as a separate and new HTML page, and therefore would not be
7 present in the Jornaya video playback of a user’s (such as Ms. Hill) visit to the
8 website.

9 **B. The Terms Of Use Were Visible To Ms. Hill During Her Visits To**
10 **LMB.YourVASurvey.info And LowerMyBills.com.**

11 23. In my opinion, the “Terms of Use” link was visible to Ms. Hill at both
12 the LMB.YourVASurvey.info and LowerMyBills.com websites.

13 24. **The LMB.YourVASurvey.info Terms of Use.** Mr. Young himself
14 concludes (and I agree) that the Terms of Use link on the LMB.YourVASurvey.info
15 website was visible to Ms. Hill during her visit to the site in October 2018.¹⁰ He
16 supports this conclusion by reference to Young Report Exhibit N to his report (a copy
17 is attached hereto as Exhibit G), which is a screenshot showing the result of Mr.
18 Young’s re-creation of Ms. Hill’s experience visiting the website. That exhibit shows
19 that the Terms of Use link was visible to Ms. Hill near the “See my results!” button
20 as she completed the submission form, and without her needing to scroll down on the
21 site to reveal the link.

22 25. Mr. Young also confirms that the ActiveProspect video playback shows
23 that “[t]he Terms of Use [hyperlink was] visible toward the bottom of the screen”
24 during Ms. Hill’s visit to LMB.YourVASurvey.info.¹¹

27 ¹⁰ Young Report at 7.

28 ¹¹ Young Report at 7.

1 26. Based on my own testing of the website, I agree with Mr. Young that
2 the Terms of Use link was visible to Ms. Hill on the LMB.YourVASurvey.info
3 website as it appears in Exhibit G hereto.

4 27. Mr. Young also opines that, even though the Terms of Use link was
5 visible to Ms. Hill, she somehow lacked a “reasonable opportunity” to view the
6 Terms of Use link because she “spen[t] one second” viewing the page in this position
7 before she “click[ed] the ‘change’ link.”¹² I disagree with Mr. Young on this point
8 and, in my opinion, his observation about the time Ms. Hill (a user) chose to spend
9 on a particular web page does not advance the relevant inquiry of what information,
10 including the Terms of Use, was actually visible and available to Ms. Hill on that
11 page proximate to the “See my results!” button at the time of her visit.

12 28. Based on my review of the website code and the ActiveProspect video
13 replay, I agree with Mr. Young’s opinion that it was only Ms. Hill’s action of clicking
14 on the “change” link that ended the one-second period for which the Terms of Use
15 link was visible to her.¹³ But the relevant point is that the Terms of Use link was
16 available and visible to her on that page proximate to the “See my results!” button.
17 It was Ms. Hill alone who was entirely in control of the amount of time the link was
18 visible to her as shown in Exhibit G (Young Report Exhibit N). It is, therefore,
19 incorrect to conclude that Ms. Hill had no reasonable opportunity to view the link.
20 The opportunity existed to Ms. Hill and she controlled how long it was available to
21 her. Put another way, had Ms. Hill not clicked on the “change” button, the Terms of
22 Use link would have been visible and accessible to her for as long as she wanted.
23 Mr. Young’s attempt to assess Ms. Hill’s opportunity to view the link by reference
24 to her own choice and her own action is, therefore, not reasonable or supported by
25 the technological evidence. His opinion is no different than concluding that a page
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27 ¹² Young Report at 7.

28 ¹³ Young Report at 7.

1 of a newspaper, magazine or book was not visible to a reader who chooses to spend
2 only one second on the page before turning to the next one.

3 29. Even if Ms. Hill had not been in control of how long the Terms of Use
4 link was visible to her (and she was), the one-second period cited by Mr. Young is
5 sufficient for a user to recognize and be on notice of the link. Based on my review
6 of relevant research and literature, a period of even less than one second of visibility
7 is sufficient for a typical user to view a webpage, including to recognize and identify
8 the presence of associated hyperlinks and terms and conditions.¹⁴

9 30. Lastly, during much of Ms. Hill's interaction with the
10 LMB.YourVASurvey.info website, even when the "Terms of Use" hyperlink was not
11 visible, the terms and conditions language was visible. As such, my opinions in
12 Paragraphs 32-35 apply equally to the visibility of the terms and conditions on the
13 LMB.YourVASurvey.info website.

14 31. **The LowerMyBills.com Terms of Use.** With respect to the
15 LowerMyBills.com website, Mr. Young opines that the "Terms of Use link is not
16 visible to the site visitor" based on his reconstruction of the website in Young Report
17 Exhibit Q to his report (attached hereto as Exhibit H).¹⁵ I do not agree with Mr.
18 Young's opinion and it is unsupported by the technological evidence.

19 32. At the outset, Exhibit H (Young Report Exhibit Q) demonstrates that
20 terms and conditions of the LowerMyBills.com website (the text on the website
21
22

23 ¹⁴ MRC Mobile Viewable Ad Impression Measurement Guidelines (June 28, 2016),
24 *available at* <http://www.mediaratingcouncil.org/062816%20Mobile%20Viewable%20Guidelines%20Final.pdf> (Media Rating Council guidelines stating that a viewer
25 has "opportunity to see" mobile web advertisements if viewable for "greater than or
26 equal to one continuous second"); Lindgaard et al., Attention web designers: You
27 have 50 milliseconds to make a good first impression! (2006) (people are able to
28 perceive the overall structure of a webpage within 50 milliseconds); Potter et al.,
Detecting meaning in RSVP at 13 ms per picture (2014) (substantial visual
processing can be done on an image in only 13 milliseconds).

¹⁵ Young Report at 8.

1 beginning with “By clicking the button above, you express your understanding and
2 consent ... to the following:”) were visible to Ms. Hill during her visit to the site.

3 33. In my opinion and experience building websites for consumer-facing
4 companies and as an academic who teaches website design, it is not relevant whether
5 the “Terms of Use” hyperlink itself was visible in a particular scrolling position of a
6 website where the site’s terms and conditions were otherwise visible to the user, as
7 was the case on the LowerMyBills.com website during Ms. Hill’s visit. A website’s
8 terms and conditions is not limited to just the “Terms of Use” hyperlink. Therefore,
9 if a user could see the terms and conditions disclosure language described above in
10 Paragraph 32, she would be on notice and aware (based on common website design
11 principles and common user experience) that the full terms and conditions would be
12 set forth in a combination of text and additional linked pages.¹⁶ The user would thus
13 know to scroll on the webpage to view the full terms and conditions (including the
14 Terms of Use link).¹⁷

15 34. Moreover, on the LowerMyBills.com page, Exhibit H (Young Report
16 Exhibit Q), it is evident that the disclosure text will continue as one scrolls farther
17 down on the page because: (1) the first clause of the disclosure terminates with a
18 colon, indicating additional text will follow; (2) the next paragraph is numbered “1”
19 and is cutoff mid-sentence by the limitation of the screen size, indicating that
20 additional text and successively numbered paragraphs will follow; and (3) a mobile
21 browser will generally display a scroll bar as soon as someone touches a smartphone
22 screen (like the one used by Ms. Hill).

23 35. Additionally, research studies and statistics show that mobile users
24 continue to scroll past what is visible when a webpage initially loads, and know to
25 scroll “below the fold” (*i.e.*, the bottom of the screen), including all the way to the

26 ¹⁶ See Exhibit B, Section IV.B, V, and Greenspun Report Exs. 4-7 (attached hereto
27 as Exhibit E).

28 ¹⁷ See Exhibit B, Section IV.B, V, and Greenspun Report Exs. 4-7 (attached hereto
as Exhibit E).

1 bottom of a page. On a smartphone mobile device such as the HTC Pixel used by
2 Ms. Hill, a user would only need to move a finger slightly on the page to scroll and
3 make the full terms and links visible.

4
5 I declare under penalty of perjury under the laws of the United States of
6 America that the foregoing is true and correct.

7
8 Executed on April 7, 2020.

9 

10

PHILIP GREENSPUN, Ph.D